REMARKS

Applicants and the undersigned again thank Examiner Winter for the courtesies extended in the telephonic interview of May 9, 2003, and for his commentary on this interview and reasons for withdrawal of the pending art rejections in the July 8, 2003 final Office Action.

In the final Office Action dated July 8, 2003, claims 1-102 were rejected and remain pending. Applicants acknowledge the withdraw of the objection to the abstract of the disclosure.

I. Commentary on Interview of May 9, 2003 and Reasons for Withdrawal of Pending Art Rejections

The Office Action stated that the Applicants' remarks were unremarkable and failed to provide the substance of the interview of May 9, 2003 that resulted in an agreement to withdraw the pending art based rejection. The Office Action further stated that at this time Applicants shall provide an explicit explanation, on the record, as to exactly why the claims are being amended, how the amendments narrow the claims, what is meant by the amendments, and how the amendments distinguish the claims from the prior art of record.

Applicants appreciate the opportunity to clarify the record as recommended by the Examiner and therefore provide the following commentary on the interview of May 9, 2003. On a point of initial clarification, the individuals listed by the Examiner as participants in the interview also included Gene Damaso, an inventor. In the interview, the independent claims were discussed with particular emphasis on claim 1. The rejections and prior art discussed during the interview were: (1) a 35 U.S.C. § 102(b) rejection by U.S. Patent No. 3,966,981, by Schultz (the '981 patent); (2) a 35 U.S.C. § 102(b) rejection by U.S. Patent No. 5,866,005, by DeSimone *et al.* (the '005 patent); and (3) a 35 U.S.C. § 103(a) rejection from U.S. Patent No.

5,370,742, by Mitchell (the '742 patent) and U.S. Patent No. 5,683,977, by Jureller *et al.* (the '977 patent).

Regarding these rejections, the Examiner restated his comments made in the previous Office Actions that the substrates in the '981 patent were food, and that nothing in the claims precluded food from being the substrate. The Applicants contended that the '981 patent does not teach a process of removing contaminants from a substrate with an organic solvent in the absence of liquid carbon dioxide, but instead teaches a method of processing food products and extracting oils from food. The Applicants argued that the extracted oils could not be considered a contaminant, but are an inherent component of the food which are extracted for consumption. However, the Examiner maintained that removing contaminants from a substrate (that is, cleaning) and processing food to extract oils were considered by him to be the same. In light of this and to expedite prosecution, Applicants agreed to enumerate the substrates as specified in the specification, which excluded food products from the claims.

In regard to the '005 patent, the thrust of the Examiner's argument centered around that the '005 patent disclosed a system that used liquid carbon dioxide to remove oils from substrates, and that the oils, even if not intended as cleaners would have the effect of dissolving oil soluble matter, and the subsequent dissolution of the oil in liquid carbon dioxide would thus remove the oil. The Examiner's arguments concerning the '742 patent centered around that it disclosed the steps of contacting a substrate (fabric) with, among other things, an organic solvent, but what was not explicitly disclosed were all the claimed solvents, which were extracted with the carbon dioxide. Regarding the '997 patent, the Examiner argued that it disclosed various silo/organic solvents currently claimed, and that one skilled in the art would have been motivated to make the instant combination to avoid impeding the cleaning action. The Examiner further argued that

inherently the carbon dioxide would remove contaminants that were not removed by the organic solvent. In response to these argument, the Applicants brought to the Examiner's attention that the present claims are directed to a process of cleaning in the absence of liquid carbon dioxide, and that substantially all the cleaning was done by the organic solvent and not the carbon dioxide. The Applicants' stated that liquid carbon dioxide was used to remove the solvent and did not contribute in any significant way to the cleaning process. In order to further clarify the claims, the Applicants agreed to amend the claims to state that substantially all of the contaminants were removed by the organic solvent. There was agreement with the Examiner that this takes into account that in some cases there might be some residual contaminants on the substrates after the cleaning process that may or may not be soluble in the organic solvent, which could be abraded from the substrates while being exposed to the liquid carbon dioxide.

In regard to the definition of "substantially" the term is intended to be used in a substrate specific manner and consistent with the specification and with the understanding of those skilled in the pertinent art. The use of the term relates to a desired level of significant soil removal that is specific to each substrate. For example, for clothes swatches the specification states at page 31, lines 24-27, that the organic solvents tested exhibited significant soil removal, as compared to densified carbon dioxide that exhibited no soil removal. Furthermore, Wascherei Forschungs Institute, Krefeld Germany ("WFK") standard soiled swatches were stained with a range of insoluble materials and WFK white cotton swatches, both obtained from TESTFABRICS, Inc., and were used to evaluate soil removal and soil redeposition, respectively. *See*, Table 3, page 32. Other substrates contemplated by the Applicants but too numerous to enumerate here that fall into one or more of the categories of a textile, a flexible structure, a precision structure, a delicate structure, or a porous structure, include such things as microchips, electronic

components, mechanical components, plastics, metals, etc. Each of these substrates would have a different desired level of significant contaminant removal before the organic solvent was removed by, among other things, liquid carbon dioxide. These desired levels would be recognized by those skilled in the art as being appropriate for each respective substrate. Support for this in the specification can be found at least on page 23, line 30, to page 24, line 3, where it states that "After sufficient time has passed so that the desired level of contaminants is removed from the textiles and organic solvent, the organic solvent is removed from the...cleaning vessel...." Furthermore, agreement was reached with the Examiner that "substantially" takes into account that in some cases there might be some residual contaminants remaining on the substrates after the cleaning process that may or may not be soluble in the organic solvent, which could be abraded from the substrates during exposure to the liquid carbon dioxide.

Claims 59-102 were added to clarify the independent claims and to expedite prosecution as it was indicated in the interview that the independent claims from which they depend would be allowable. Support for each claim was provided in the Applicants' May 30, 2003 response. The claims further limit the claims from which they depend and are allowable once the base claims have been allowed. The desire to add additional claims was mentioned by the Applicants during the interview and no concern was raised by the Examiner. Applicants apologize for any inconvenience that this misunderstanding may have caused the Examiner.

II. Rejection of Claims 1-102 Under 35 U.S.C. § 103(a)

Claims 1-102 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over U.S. Patent No. 5,370,742, by Mitchell (the '742 patent) and U.S. Patent No. 5,683,977, Jureller *et al.* (the '977 patent). The Office Action stated that the '742 reference discloses the steps of contacting a substrate (fabric) with *inter alia* an organic solvent...What is apparently not

explicitly disclosed are all the claimed solvents, which are extracted with the carbon dioxide. The '997 reference discloses the various silo/organic solvents currently claimed. See specifically columns 5-16. The artisan would have [been] motivated to make the instant combination for the reasons explicitly set forth in '742, namely to avoid impeding the cleaning action. It is noted that the solvents would be selected for the reasons set forth as well, namely their compatibility with liquid carbon dioxide. Absent such compatibility the organic solvents are disclosed to potentially adhere to the substrate.

Applicants respectfully traverse this rejection and request reconsideration and withdrawal of this rejection.

As a preliminary matter, Applicants do not believe that the '742 and '977 patents can properly be combined in the manner suggested by the Examiner. The organic solvent disclosed in the '742 patent are for pretreatment, not for removal of contaminants, while the actual cleaning process occurs in a densified gas such as in carbon dioxide. The '977 patent provides a dry cleaning system which replaces conventional solvents with densified carbon dioxide in combination with selected cleaning surfactants." *See*, column 2, lines 57-59. Specifically, the '977 patent discloses a system of dry cleaning using densified carbon dioxide and a surfactant in the densified carbon dioxide. The surfactants used are a polysiloxane, a branched polyalkylene oxide, and a halocarbon group which is a functional CO_2-phillic moiety connected to a CO_2-phobic functional moiety.

In contrast the claims as they now stand in front of the Patent Office, claim in one aspect, a process for cleaning a substrate by removing substantially all of a contaminant with at least one organic solvent in absence of liquid carbon dioxide. The organic solvent is then removed from

the substrates using at least one pressurized fluid solvent, and when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition.

Thus, the cleaning process of the cited references does not suggest or teach the present claimed invention of cleaning a substrate by removing substantially all of a contaminant with at least one organic solvent in absence of liquid carbon dioxide. Because these references do not disclose a cleaning process or system other than that based on carbon dioxide, these patents do not suggest or teach the present invention directed to cleaning a substrate by removing substantially all of a contaminant with at least one organic solvent in absence of liquid carbon dioxide. Therefore, the '742 and '997 cannot render obvious the process claimed in the present invention, and claims 1-102 are patentable over the '742 and '997 patents.

For at least the afore-mentioned reasons, Applicants respectfully submit that claims 1-102 are presently in condition for allowance and request favorable consideration and timely allowance of these claims.

III. Rejection of Claims 1-102 Under 35 U.S.C. § 102(b)

Claims 1-102 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,866,005, by DeSimone *et al.* (the '005 patent). The Office Action stated that the '005 patent at column 1, line 20 *et seq.*, discloses that prior art systems used liquid carbon dioxide to remove oils from substrates. The oil, even if not intended as cleaners would have the effect of dissolving oil soluble matter, and the subsequent dissolution of the oil in liquid carbon dioxide would thus remove the oil, lacking here is the specific disclosure of the organic solvent. The Office Action further states that at column 3, line 19-41, the '005 patent discloses *inter alia* diethyl ether of the present invention, and goes on to state "the co-solvent or modifier can be

used prior to, during, or after the substrate is contacted by the carbon dioxide fluid. Columns 3 through 18 disclose the various organic/silo-organic solvents.

In contrast, the present invention is directed to in one aspect to a process for cleaning a substrate by removing substantially all of a contaminant with at least one organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and removing the organic solvent from the substrates using at least one pressurized fluid solvent. When the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition. The '005 patent is directed to a carbon dioxide based cleaning process. Specifically, the process comprises contacting the substrate to a carbon dioxide fluid which contains an amphiphilic species. As a result, the contaminant associates with the amphiphilic species and becomes entrained in the carbon dioxide fluid. *See*, the '005 patent, column 2, lines 27-33. Therefore, the carbon dioxide based cleaning process to remove oils from substrates used in the cleaning process of the '005 patent cannot anticipate the invention claimed in claims 1-102.

For at least the afore-mentioned reasons, Applicants respectfully submit that claims 1-102 are presently in condition for allowance and request favorable consideration and timely allowance of these claims.

IV. Claim Rejections Under 35 U.S.C. § 112

Claims 1-102 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Office Action stated that "There is no recitation supporting the proposition that 'substantially all of a contaminant' is removed with the organic solvent."

Applicants respectfully traverse this rejection and request reconsideration and withdrawal of this rejection.

Under 35 U.S.C. § 112, first paragraph, it is only required that the specification describes the invention sufficiently for those of ordinary skill in the art to recognize that the applicant invented the subject matter he now claims. *In re Voss* 194 USPQ 267, 271 (CCPA 1977). Applicants contend that the claims, when read by one of ordinary skill in the art in light of the supporting specification, clearly defines the metes and bounds of the invention, and clearly sets forth the subject matter of the invention, and that one skilled in the relevant art would clearly recognize that Applicants invented the subject matter they now claim.

One skilled in the art would recognize that the use of the phrase 'substantially all of a contaminant' when read in light of the specification relates to a desired level of significant soil removal from a substrate that is specific to each substrate processed. For example, for clothes swatches the specification states at page 31, lines 24-27, that the organic solvents tested exhibited significant soil removal, as compared to densified carbon dioxide that exhibited no soil removal. Furthermore, Wascherei Forschungs Institute, Krefeld Germany ("WFK") standard soiled swatches were stained with a range of insoluble materials and WFK white cotton swatches, both obtained from TESTFABRICS, Inc., and were used to evaluate soil removal and soil redeposition, respectively. Furthermore, the Examiner's attention is respectfully drawn to page 31, lines 18-24, in the specification as originally filed, which states:

> Because the Delta Whiteness Index is calculated by subtracting the Whiteness Index of a swatch before processing from the Whiteness Index value after processing, a positive Delta Whiteness Index indicates that there was an increase in Whiteness Index as a result of processing. In practical terms, this means that soil was removed during processing. In fact, the higher the Delta Whiteness Value, the more soil was removed from the swatch during processing.

The Examiner's attention is further directed to page 32, Table 3, showing a comparison of two Delta Whiteness Indices, soil removal and soil redeposition, on test swatches for several organic solvents and densified carbon dioxide. This comparison shows that no soil removal was obtained by using densified carbon dioxide, but significant amounts were removed using various organic solvents. Therefore, when read by one of ordinary skill in the art in light of the supporting specification, the phrase 'substantially all of a contaminant' clearly defines the metes and bounds of the invention. It clearly sets forth the subject matter of the invention that one skilled in the relevant art would clearly recognize that Applicants invented the subject matter they now claim.

For at least the afore-mentioned reasons, Applicants respectfully submit that claims 1-102 are presently in condition for allowance and request favorable consideration and timely allowance of these claims.

CONCLUSION

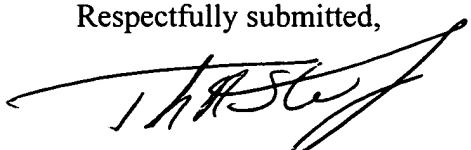
With entry of the above Amendment and Response and in view of the foregoing remarks, it is respectfully submitted that claims 1-102 are in condition for allowance.

It is respectfully submitted in view of the foregoing Amendments and Remarks that all of the objections and rejections in the final Office Action dated July 8, 2003 have been overcome and should be withdrawn. Applicants respectfully request early and favorable notification to that effect.

If, in the opinion of the Examiner, a phone call may help to expedite prosecution of this

application, the Examiner is invited to call Applicant's undersigned attorney at (312) 701-8775.

Respectfully submitted,



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